Space Weather Forecast

Issued on Saturday, 09 September 2023 at 13:17 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class flares (R1-R2 radio blackouts). Slight chance of CME arriving late on Day 1 (09 Sept) or early Day 2 (10 Sept).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours. There are currently five numbered and two unnumbered sunspot regions on the visible disc. The largest region is near center disk, with continued slight growth observed. The elongated region in the northwest also continues to see some slight development, though changes becoming harder to observes as it rotates towards the western limb. The moderately sized region in the northeast has shown some consolidation but continues to display magnetic complexity. Two new unnumbered spots developed in the southern hemisphere. No Earth-directed CMEs have been observed in available coronagraph imagery in the past 24 hours.

Solar Wind / Geomagnetic Activity: Solar wind parameters were indicative of a slow regime. Solar wind speeds were mostly between 350-400km/s. The Interplanetary Magnetic Field (IMF) was weak throughout. The north-south component also varied weakly. Geomagnetic activity was Quiet to Unsettled (Kp 0-3).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain mostly Low but with an ongoing chance of isolated Moderate flares and a very slight chance of an isolated Strong flare.

Solar Wind / Geomagnetic Activity: A slow CME (coronal mass ejection) which left the Sun on 05 Sept has been modelled to have Earth-directed component, expected to arrive late on Day 1 (09 Sep) or early Day 2 (10 Sep), with a increase in wind speeds to slightly elevated levels possible, bringing a chance for some enhancement of geomagnetic activity. No other Earth-directed CMEs have been observed in the last 24 hours. In the absence of significant CME effects, the solar wind is most likely to remain slow-ambient, though there may be slight enhancements at times.

Geomagnetic activity is expected to be mostly Quiet to Unsettled, but with a risk of becoming Active with a slight chance of isolated G1/Minor Storm intervals late on Day 1 into Day 2 (09-10 Sep) should we see any CME influence. Mostly Quiet to Unsettled conditions expected to return Days 3 and 4 (11-12 Sept).

Energetic Particles / Solar Radiation: Solar radiation storms are unlikely, with a very slight chance of an enhancement should any larger flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	10	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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